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FUNDING THE MAINTENANCE OF LOCAL ROADS IN MASSACHUSETTS

A Policy Analysis Exercise submitted by Robert W. Zimmer in partial fulfillment of the Master of Public Policy degree requirements.

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I. INTRODUCTION

Although Massachusetts can boast of having undergone an "economic miracle" compared to other parts of the country, it has not necessarily paid more attention to its infrastructure needs, particularly its local roads. Partly this reflects the prevailing national tendency to spend less on such needs; public works capital spending at all levels of government has been declining during the past twenty years (1), and data from the U.S. General Accounting Office show that state and local capital investment on public works has fallen 37%, from a high of $35.9 billion in 1968 to $22.6 billion in 1982 (both figures in constant 1972 dollars). Measured in per capita terms, state and local public works spending declined from $179 per person in 1968 to $95.9 per person in 1982.(2) While the nationwide decline started before the 1980s, there is no doubt that in some states the problem of inadequate funds for infrastructure maintenance has worsened in this decade of taxpayer revolt. Massachusetts is such a state. The enactment of Proposition 2 1/2 in 1981 limited the funds available to local governments in a particularly stringent manner. Towns and cities made tougher choices and thus allowed some programs to suffer.

Today, we face a situation where many towns and cities have deferred local road maintenance. On a broad scale, research by the Massachusetts Taxpayers' Foundation (MTF) found that capital spending by local government was declining in real terms prior to Proposition 2 1/2's introduction in 1981, but then dropped sharply in FY 1982: real spending fell 55% from the three-year average just prior to enactment.(3) Local spending for road operating expenses had been rising in real terms but then fell by 7% in FY 1982.(4) The rise in operating expenditures before 2 1/2 is less reassuring than it appears, however, since less capital spending will always require more operating costs to keep infrastructure usable.

The figures for the broad category "operating costs" do not focus on maintenance versus all other activities. The difficulty lies in the nature of local record-keeping, which is crude by state standards, hindering detailed analysis of whether road spending is for pavement maintenance or for other activities. The Metropolitan Area Planning Council estimates that local spending for road maintenance declined by over 50% in the greater Boston area between 1978 (before 2 1/2) and 1985; in 1986 dollars, spending fell from $56 million annually to $26 million.(5) Little reason exists to believe that the rest of the state fared much better, though for lack of data, this analysis assumed that the percentage of highway budgets spent on maintenance did not change from year to year, and thus cannot take into account the possibility that a higher or lower proportion of local highway budgets was spent on maintenance over the last several years.

So while it is hard to pin down changes in particular types of local highway accounts, less total local road spending combined with inventory reports of mediocre road quality (6) suggest that some kind of redress is in order. This conclusion will not startle the ordinary citizen. Many drivers familiar with the roads of greater Boston have come home at some point to complain and grumble about the roads. One radio call-in program invited listeners to phone in the locations of especially bad potholes; listeners competed to call in the biggest pothole, thereby providing cities and towns with an extra incentive to fill the holes. But anecdotes aside, the MAPC study found that local roads within 101 greater-Boston communities would require $143 million annually over the next ten years to bring all local roads to excellent condition; the amount tempered by economic reality and practical considerations is $113 million annually, which would bring local roads to "reasonable" condition.(7) This amount, the report claims, would be well above the current spending on maintenance, but well below that needed if road conditions deteriorate further to the point where many more miles would have to be rebuilt rather than repaired.

The MAPC study reached conclusions similiar to a 1982 study done by The Road Information Program (TRIP) of Washington, D.C., which found that the state as a whole needed to spend $500 million a year for ten years to bring all roads to excellent condition.(8) Using the MAPC figures for the greater Boston area and extrapolating, it would cost the Commonwealth about $440 million to bring all roads to excellent condition, and about $350 million to bring all roads to "reasonable" condition (both figures are annual expenditures over a ten-year period.) Thereafter, both studies claim, annual spending on local roads need only be a small amount.

The Problem and the Role of This Report

When thinking of possible ways to fund more local road maintenance, one should first consider why the current decline came about. Perhaps local roads have been an easy target because in the short run roads can do without funds and appear to stay in reasonable shape, allowing local governments to spend money in areas where cutbacks are immediately evident, such as schools, or fire and police protection. The problem may become compounded when localities have no systematic method for determining when roads should be maintained, and thus do not understand the tradeoff between spending now for routine maintenance and spending later for emergency maintenance or replacement. (As this report will examine later, the existing incentive structure of state assistance programs may also lead to poor spending decisions at the local level.) This "management factor" certainly is relevant. In a 1982 study, the Massachusetts Taxpayers Foundation stated that infrastructure problems were compounded by the lack of local management expertise in capital planning.(9)

To begin to correct the lack of understanding of tradeoffs at the local level, the MAPC has set up a pilot program for training highway superintendents in the techniques of pavement management. The program aims to help highway superintendents understand the condition of their road inventory and the amount of funds needed to improve overall conditions, as well as to help the localities spend funds more efficiently. This report, then, tackles the second aspect of the problem by identifying and refining options to help fund the increased amount of needed maintenance. (While better highway management by localities may lead by itself to more efficient use of funds, thereby decreasing the amount needed to improve roads, this report will take the full amount into consideration.)

II. SETTING UP A FRAMEWORK FOR EVALUATING OPTIONS

This section sets up a framework for evaluating the many possible funding options. The section first finds that both state and local governments should help with funding. It then explains how the 1986 Revenue Cap plays a large role with both state and local options. Third, it explains the criteria of equity, efficiency, and politics that help evaluate all options.

What level of government should provide the funding?

The best way to determine what level of government should provide funding is to study the nature of the roads in question to determine who benefits from their existence. An examination of the statewide road system leads to the conclusion that the responsibility for funding should be split between the state government and local authorities.

The roads that are the subject of this report include only those roads not serviced by state, federal, and other authorities unconnected with local government. Roads under the jurisdiction of local government are then divided into three categories:

LOCAL SERVICE roads, which are intended to serve abutters rather than through traffic
COLLECTOR roads, which serve to connect the LOCAL SERVICE roads to the nearest ARTERIALS
ARTERIAL roads, which move traffic among population centers; this includes city throughways

This report uses "local roads" to mean all three subcategories described above. The term "local service roads" is used precisely as defined above, and is not interchangeable with "local roads."

To help in the design of funding options, Table 1 shows the breakdown of categories within the Commonwealth:

TABLE 1: ROAD SYSTEM WITHIN THE COMMONWEALTH

By Jurisdiction

State	2881 miles	(8.5%)
MDC, MA Turnpike Authority, others	853 miles	(2.5%)
Local-Accepted	26254 miles	(77.7%)
Local-Unaccepted*	3806 miles	(11.3%)
TOTAL	33794	

*Unaccepted roads are those not officially accepted as town or city roads by local authorities, but which will ultimately fall under local jurisdiction.

By Subcategory of Local Roads

Local Service	20380 miles	(67.8%)
Collector	6198 miles	(20.6%)
Arterials	3493 miles	(11.6%)
TOTAL	30061	

SOURCE: MDPW Bureau of Transportation Planning and Development, Statewide Transportation Section, current data.

A good case exists for requiring local funding for the maintenance of local roads. The tables indicate that a majority of roads within the Commonwealth are local roads (accepted and unaccepted, 89%). The state already funds state and MDC roads, however, so the relevant issue is to see how much of the local roads serve strictly local interests, or, in other words, have no "broad use" characteristics. Local service roads are those designed to serve property abutters, in contrast to collectors and arterials that serve largely to move traffic from point to point. While one may argue that collectors and arterials serve the general public, and not merely those living and doing business along the way, the argument is harder to make with respect to the local service streets, which are built with purely local interests in mind (to allow the property abutters to travel to and from their residences.) And as the table shows, just over two-thirds of all roads under local jurisdiction exist for the purpose of local benefits. In this sense, those receiving local benefits should pay for them, and therefore local governments have a direct responsibility to provide significant funding for local road maintenance improvements.

At the same time, the fact that almost one-third of local roads serve the interests of the general public requires that the state assist localities. Economic logic indicates that assessing a locality the full cost of maintaining a road used by substantial numbers of out-of-town drivers makes little sense. Furthermore, even some local service roads receive "public" use. As an official at the Department of Public Works put it:

> "Everyone knows the shortcuts over sidestreets that gets them around a traffic light or a busy intersection. The roads aren't designed for that extra use, but they get it anyway." (10)

So a combined effort by localities and states makes good economic sense. Such a system is already in place; localities appropriate funds for road work, while the state also provides aid (as discussed in Section IV). Therefore, this report will analyze both local and state options, and then analyze how the best of both types might be combined to create a rational funding system.

A Controlling Piece of Legislation: The 1986 Revenue Cap

Before considering a mix of possible local and state options to fund road maintenance, one must consider the effect of the 1986 Revenue Cap, which passed by referendum in November of that year. This referendum sought to limit the size of state government by limiting the growth of state revenue on an annual basis.

The major implications of this law, cited as Chapter 555 of the Acts of 1986, are as follows:

(a) Any year's state tax revenue growth is limited to the average growth in Massachusetts wages and salaries over the last three years. In other words, state government tax revenues can only grow as much as the state's economic growth rate.

(b) The definition of taxes includes, but is not limited to, all types of income, sales, and excise taxes. It does not include funds from federal reimbursements, proceeds from bond issues or payments needed to retire debt, earnings on investments, and service charges like sewer and water fees.

(c) The state cannot simply avoid the law's intent by passing legislation granting authority to local governments to raise an existing tax or implement a new tax. If such authority is granted, the allowable state tax revenues are decreased by the amount of additional local revenue.

By itself, this law means that it is not enough to convince the state authorities that more money is needed to improve the condition of local roads; an additional hurdle now exists since any large program expansion can only occur at the expense of some other existing program. (The state has been at its revenue limit since the enactment, and indeed had to refund taxpayers $29.2 million in FY 1987.(11)) Unless the state uses bonds and/or fees, increasing the funding for local roads by $350 million annually would require the reduction of some other state program by a similiar amount, which makes the goal even more difficult.

However, the revenue cap issue is not completely straightforward. Two weeks prior to the referendum, the Massachusetts legislature passed a more lenient alternative that (a) allows the state to exceed its limit for the purposes of increasing revenues earmarked for local aid, and (b) does not count increased local revenues in the overall state count. This law, then, gives the state more latitude for assisting localities. By this statute (Chapter 488 of the Acts of 1986), strictly local options would not fall under the purview of the Revenue Cap, and state revenue earmarked for a specific purpose might also escape the limit.

Due to the relatively recent passage of these laws, some confusion exists. With both tax caps on the books, which one actually takes precedence remains unclear; further legislation is needed to resolve the uncertainty.(12) Certainly if the referendum law ends up taking precedence, then the range of viable funding options would be more constrained.

Criteria for Screening Funding Options

This report analyzes a large number of local and state options. To help evaluate them, it is best to first list and define the relevant criteria that will serve to differentiate the options. These criteria are the standard ones found in any substantial discussion of public finance; they fall into three broad categories:

Equity addresses the issue of fairness. The principle of user equity says that people using the same amount of a service should pay the same fee for its use; in other words, it is not fair to charge a flat fee to those who use a lot of the service and those who use only a little of it. (This type of equity ties in very closely with efficiency, which is discussed below.) Income equity says people should be charged according to their ability to pay; society acknowledges the different incomes among citizens, and does not wish to have poor households pay a larger percent of their incomes than wealthier households for the same service. A tax or fee that results in wealthier households paying a larger proportion of income than poor households is said to be progressive; in the opposite case, the tax or fee is regressive.

Efficiency addresses the issue of how well society uses its resources. The concept has many dimensions; this report will focus on just three:

(a) the administrative cost burden;

(b) the distortion cost burden; and

(c) the "real value of use" element.

The administrative burden is unavoidable, since any tax or fee collection requires the state to use resources for collection and enforcement; the issue is how large the administrative costs are compared to the tax revenue. Generally, taxes or fees with smaller administrative burdens are preferred, but tradeoffs must be made. A particularly striking dilemma comes with a user fee system. Such a system does a good job of measuring and assessing costs to citizens based on amount of use, which means it does a good job in the user-equity sense. At the same time, however, a system charging incremental costs for incremental usage must incur large administrative costs to keep track of the transactions. The danger is that large administrative costs may eat up so much revenue as to negate any advantages, and thus force authorities to fall back on more blunt, but simpler, systems to raise revenue.

Another part of the efficiency concept is that of minimizing the distortion cost burden. The distortion issue has many facets, but in general it focuses on how a tax or fee will change people's behavior in ways that make sense to the individual while not making sense for society. Suppose, for example, that Massachusetts taxes liquor at a significantly higher rate than New Hampshire. Individuals will use time and gasoline to drive to New Hampshire to buy liquor. While this may save the individuals money, from society's perspective the time and energy spent to go to New Hampshire is wasted--and Massachusetts still will not receive the tax revenue, since the liquor was bought in another state. From society's view, it may be better to reduce the Massachusetts liquor tax in order to save time and energy.

The final aspect of efficiency is communicating the real value of use. If the method of funding forces those incurring the costs to actually pay for the service, then the users will demand only as much of the service as they truly need; similarly, the voters who have to pay for the service will have an incentive to spend the appropriate amount on the upkeep if they understand the true cost. An example is a service fee (a flat fee) versus a user fee (a variable fee based on incremental usage). The variable fee is not only more equitable, as noted above, but it is also more efficient since it provides an incentive for people to use only as much of a service as they are willing to pay for it, while the flat service fee provides no such incentive, and may encourage use beyond the efficient (as measured by willingness to pay) level. A widespread example is local water service. In the past century, many cities and towns have gone to the expense of installing water meters as they have found the flat fee system encourages waste. An efficient funding option may also encourage alternative use if the primary use causes externalities; a strong example of this is a high enough gasoline tax to encourage the use of carpooling and public transportation instead of single-person, private car usage.

Current Attitudes, Current Politics takes into account the events in the greater world that might have an impact on the funding method. While some funding options have political popularity or notoriety for equity or efficiency reasons, some options have political lives all their own. But before going on, one rule of thumb is worth remembering: the closer the revenue sources are related to either the costs of local roads or the benefits received from local roads, the more acceptable they are likely to be perceived by the electorate. Fortunately, this rule of thumb has consistency with both user equity and "value of use" efficiency.

Finally, this report will depart from standard public finance criteria in two ways. First, the three listed criteria will more fully differentiate the larger number of state options than the few local options. This is due to the nature of local options: while attention must be paid to the theoretical underpinnings, the range of local options is most constrained by the existing political reality. In a sense, less latitude exists in considering reasonable local alternatives, while on the state level, a broad range of options exists, and is thus more conducive to a rigorous theoretical analysis. The second departure concerns the delay of the revenue test, (which simply determines if the option can do the job by raising enough revenue.) This discussion appears later in this report (Section V) because a careful revenue test of all options serves little benefit when many options will not warrant further consideration. Therefore, the options will receive an initial screening with the categories just discussed, and the strongest options will face the revenue test in Section V.

III. LOCAL SOURCES OF FUND

Before analyzing the various options, it is worth looking at the merits of local options in general. Advocating local sources of funds for improving the maintenance of local roads is a reasonable proposition based not only on the nature of local roads but also on the idea that localities should themselves make amends for their slowdown of spending in recent years. Localities have given up responsibility for funding many different programs (13) without a state-wide debate on the merits and problems of such a process; in the case of local roads, it is not fair for localities to ask the state for more funding just to keep local tax rates low.

In an economic sense, a strong case exists for forcing localities to be responsible for their own road funding since localities would more efficiently spend money that they themselves had to raise. Voters would have to decide to raise the funds and improve roads to a level matching the opportunity cost, or next best use, of funds; reliance on state funding would not encourage this efficient expenditure of funds, for voters do not see the funds as coming out of their own pockets. In other words, the cities and towns are better able to sense whether an improvement in local road maintenance would be worth the cost.

The disadvantage of relying on local funding sources is the ability of the wealthier towns and cities to finance improvements while the poorer localities continue to have inferior roads. This potential imbalance, however, can be partially corrected by additional state help to the poorer areas, as is done with other types of programs.

Three local options follow, beginning with Proposition 2 1/2:

1. Proposition 2 1/2 Override

One sound policy would be to simply allow the status quo to continue. In other words, localities currently have the tools to generate significant funds to fix their roads if they perceive that a strong case exists for fixing roads. With the beginnings of an MAPC effort to educate the local highway superintendents, the towns and cities will undoubtably reach a point in the future where, if they are already up to their Proposition 2 1/2 spending limits, overrides will occur. (Some towns, such as Hopkinton, have already overridden for this purpose.) This strategy may make more sense than appropriating money through new local means and having the cities and towns spend it before they perceive a strong need.

Another favorable point for this option is that the revenue raised would not be subject to the revenue cap laws, even the more stringent Chapter 555. In fact, of all the local and state options presented in this report, this is the only non-fee, non-debt option with such an advantage.

General wisdom has it that overrides are hard to accomplish. This is only partly true. The old two-thirds popular vote rule, a stumbling block in the past, no longer exists; a legislative change in 1986 requires only a majority popular vote to override, which undoubtably makes for an easier task. In addition, there are three different types of overrides, with varying degrees of success:

Capital Outlay Expenditure Exclusion. This requires a two-thirds vote of the town selectmen or city council, and a majority popular vote by referendum. An affirmative vote allows the locality to exceed its levy limit and/or levy ceiling for the express purpose of raising funds for capital project costs. The locality will collect the additional amount of revenue for the year of purchase only. In FY 1987, 78% of such votes were successful: a high rate, but perhaps not a surprise in light of the one-year, stated purpose requirement. (14)

Debt Exclusion. This requires a two-thirds vote of the town selectmen or city council, and a majority popular vote. An affirmative vote allows the locality to exceed its levy limit and/or levy ceiling for the purpose of paying off debt service costs. The locality will collect the additional revenue only for the duration of the debt obligation. In FY 87, 77% of such votes were successful.

General Override. This requires a majority vote of the town selectmen or city council and a majority popular vote. An affirmative vote allows the locality to exceed its levy limit for permanent increased capacity; no specific purpose must be cited, unlike the two other categories. This type of override has much less chance for passage than the other two; in FY 87, just 40% of such votes succeeded.

For the purpose of local road maintenance, the implications are that if a town can rehabilitate its roads in one year or fund the work through debt, the chances for an affirmative vote are good. Otherwise, Proposition 2 1/2 presents an obstacle. Relying on a general override--funding a long-term project without issuing debt--is a risky proposition.

Another point requires serious consideration. Data on votes since 1982 show that affirmative votes occur mainly in smaller communities.(15) Appendix 1 shows override data for FY 1987, and illustrates that localities with populations of more than 10,000 people find it extremely difficult to override 2 1/2. In this sense, forcing cities to rely on Proposition 2 1/2 to fix their roads makes little sense, even if their roads become very poor; the experience to date shows that the larger communities, which are generally acknowledged to have worse civic problems than smaller communities, have much harder times convincing voters to fund projects.

Nonetheless, this option has merit in that it allows voters to explicitly evaluate their willingness to pay for local road work; any revenue raised by this method will not fall under the revenue cap; and it is an existing, relatively simple way to generate funds.

2. Auto Excise Tax

The auto excise tax is a personal property tax on the ownership of automobiles. The current rate is $25 per $1000 vehicle valuation; this option would increase the rate.

The current rate is significantly lower than it once was; Proposition 2 1/2 reduced it from a historical rate of $66 per thousand to $25 per thousand. Proponents of the referendum initiative felt that this excise tax had become abused over time, and was used by localities as a general revenue measure rather than a road-financing measure. (16)

If the case is now made, however, that more money is needed for the specific purpose of maintaining roads, then perhaps a rate raise is in order. In order to evaluate such a justification, one must determine if localities are spending the same or more on roads than they collect by the current excise tax. Table 2 shows what localities currently spend on roads, what they receive from state reimbursements, and what they take in from auto excise revenues:

TABLE 2

Estimated current spending by all localities on roads	$347 million
Reimbursements by the State	
Chapter 90 matching	$ 18
Chapter 90 bonds	$ 30
Chapter 81	$ 22
Other	$ 31
Total spent by localities and not reimbursed by the state	$246
Amount collected by localities from the auto excise tax	$241

SOURCE: Department of Revenue, Division of Local Services. A detailed explanation of the accounts appears in Appendix 2. All figures are for FY 1986.

As the table shows, localities currently spend the same amount on local roads as they receive from auto excise taxes. If one makes the argument that roads need more maintenance work, then the argument follows that auto excise taxes are a logical method to fund the work.

This option has other strengths: it is easy to administer, for local governments already have this information and the administrative capacity to collect the fees. It is progressive since more expensive cars, which belong primarily to the wealthy, pay larger excise taxes (though the tax is deductible from federal income taxes.) Additionally, it has strength in the user-equity sense, since people who drive more tend to own newer--and therefore more highly valued--autos than people who drive less.

3. Transportation Utility Service Fee

The Transportation Utility Service Fee (TUF) is a system designed to assess property owners a fee as if roads were a utility, like sewer and water services. This relatively new idea is justified by the argument that local roads, particularly local service roads, exist largely for the purpose of local property owners, and most other taxing methods do not recognize this fact. Therefore, though sometimes proclaimed as a user charge that assesses charges based on costs, this method actually assesses fees based on benefits received. Voters within a jurisdiction decide how much to spend on local road maintenance, and the billing to abutters is computed. The billing method varies; in Pocatello, Idaho, the city uses the Institute of Transportation Engineers' (ITE) statistical study of traffic generation by property usage to assess charges, while in Fort Collins, Colorado, the formulation is much simpler, with property frontage and residential/industrial categories being assessed different rates. (Appendix 3 provides more information on the programs and their assessment practices.)

The main strengths of this option are its avoidance of Proposition 2 1/2 and the 1986 Revenue Cap provisions, and the potential for an excellent system of assigning charges based on benefits received. The TUF system would avoid the restrictions of the above laws because it would operate on a fee-for-services basis, and both laws exempt such systems from coverage. The second advantage merely reflects the fact that a system based (for example) on the ITE traffic generation charts is inherently a closer approximation of received benefits among classes of users than are systems that assess charges based on property or auto value.

The disadvantages include those of a new system, such as the administrative costs of set-up and probable legal challenges (see appendix 4). This system only approximates the road use generated by different land uses, and may be called too blunt by its critics. People may perceive it as simply a subterfuge for residential property taxes, and recognize that property taxes, at least, were deductible from federal income taxes (fees are not). The groups sponsoring Proposition 2 1/2 would fight against this system, and label it as merely an end-run around Proposition 2 1/2.

SUMMARY and the Strongest Options

The two options presented for further analysis are the Proposition 2 1/2 override and the auto excise increase. The TUF idea may have more strength in the future, but for now it simply looks too complicated and too controversial for generating revenue quickly. The two local options shall be further critiqued in Section V; the next part of this report looks at the statewide options.

IV. STATEWIDE SOURCES OF FUNDS

State aid to local road maintenance comes through a variety of sources, but predominantly through two types of aid: Chapter 90 and Chapter 81 aid. (For more information on these programs, see Appendix 5.) Before looking at the specific state options, it is worthwhile to discuss the merits of broad-based state funding options in general. One strength is that the state may be more efficient than the cities and towns in raising money for local roads. It has the administrative capacity already in place and more authority and experience in revenue raising. Also, the state may distribute the money in a more equitable manner; if the responsibility for funds were solely on a local basis, as mentioned above, then road quality among wealthier and poorer areas might vary tremendously. State distributions, though, could take such inequities into account, thereby allowing a more even maintenance standard across local borders.

On the other hand, one must consider that towns have been in effect giving up responsibility for local road maintenance, and now the state would be more involved without a debate on the proper extent of state responsibility. Furthermore, while we may assume the state can more efficiently raise funds for local road work, decisions on the spending side are generally more efficient at the lower level--in other words, localities will more efficiently spend money that they themselves must raise, since they are less able to perceive the opportunity costs of state grants.

This section considers seven state funding options; for each it:

a. Shows how the option is currently used, if applicable.

b. Briefly evaluates the option using the criteria explained above (equity, efficiency, current attitudes/politics).

It then summarizes the evaluations and designates the strongest candidate--the gas tax--for further analysis.

1. General Revenue

The increased use of the state's general revenue is a possibility for funding. This option would have the advantage of some degree of income equity, since part of the state's general revenue comes from the state income taxes; these are somewhat more progressive than pure sales taxes and user fees. However, a very loose connection exists between the payment of income taxes and road usage; the user equity case is extremely weak. And as the option of more general revenue support is truly an option of a higher state income tax (or a cut in another program, even before taking into account the revenue cap), a major disadvantage of the option is the reluctance of voters to raise income taxes for the use of local road improvements. Another weakness of this option is the irregular nature of general revenue appropriations--legislative action would be necessary on an annual basis, which would not ensure a steady flow of funds for this long-term program.

2. State Bonds

Another option would be to use more state bond issues. A strength of this is the relative certainty of the funds--unlike using general revenue, funds from bond issues would be certain over the ten-year project span. Also, bond issues have been politically popular as of late, and may be a relatively painless way to fund this work, particularly in the face of the revenue cap.

However, using bonds has problems that need careful consideration. Despite a recent reputation as a panacea for cities and states, bonds have the inherent problem of shifting the burden for payment to a future group of taxpayers. In other words, if the problem this report seeks to solve is inadequate funding by past users of roads (who presumably received the benefits of use without making corresponding payments for the proper upkeep for the roads), then it seems especially inequitable (across a time-line of taxpayers) to bring benefits in today while passing off the costs (bond repayments) to future users.(17) The method of repayment seems a weakness also. If the bonds are repaid through general revenue, then the same loose connection (between income tax payers and road users) exists. If the bonds were to be paid off by receipts more related to road use, such as a gas tax, then this weakness might be mitigated, but more often than not, the liability of bonds falls upon the general taxpayer.

3. General Sales Tax

Some states have dedicated portions of sales taxes to the maintenance of roads. This is certainly a possibility in Massachusetts, especially when one considers the large revenue potential of sales taxes compared to almost all other taxes. But sales taxes, even those exempting items as food and clothing, are one of the more regressive forms of raising funds. Moreover, little connection exists between the payers of a general sales tax and the users of local roads. (Some would argue that a sales tax on road-use items would solve this problem, and options of this type--gas and autos--are addressed below.) Some would argue that since businesses operate on local roads and receive the benefits of transportation, they should help pay for the upkeep; however, the costs of sales taxes are generally borne by the buyers of the products, not by the businesses.

4. Title, Registration, and Drivers' License Fees

These fees and their corresponding collection systems represent a regulatory mechanism as well as a revenue mechanism. The current fees are $15 for a vehicle title, $24 for a two-year vehicle registration ($7 per 1000 lbs. commercial vehicle rate), and $25 for a 4-year driver's license.

To raise these fees would have these advantages over the other state options: first, while the administrative costs of such fees are relatively high at 13% (18), the marginal cost of such increases may be lower since the systems are already in place (19), and the distortionary effects of fee hikes would be small, since most people do not make vehicle purchase decisions based on registration and license fees.

Such fee hikes, however, would face a large equity problem and a political problem. The equity problem concerns the flat-fee structure. Since all pay the same price, the fee hike would fall disproportionally on the lower-income vehicle owners and drivers. Thus, even if one argues that vehicle fees in general are progressive (since wealthier people are more likely to own and operate vehicles), within the group of existing owners and drivers, the fees are regressive. The political problem is this: currently, the revenues from these fees go to the Highway Fund, and this fund, which pays for a variety of programs connected with transportation needs, currently runs its own deficit, which was almost $80 million in FY 87.(20) If such fees were raised, strong interests might want to see the additional revenue placed in the Highway Fund.

5. Vehicle Sales Tax

The current sales tax on vehicles is 5% of the purchase price minus the trade-in value. This is a strong option in terms of equity. It works well for income equity since wealthier people tend to buy more expensive cars, and would pay correspondingly higher sales tax. It also works well in the user equity sense, since people who drive more miles tend to "use up" cars faster, and buy new cars more often, than people driving less.

The disadvantage lies in the distribution of funds: 40% of vehicle sales tax receipts already go to (general) local aid. If towns did receive larger amounts under this program, there is no guarantee the funds would be used for local road maintenance; the possibility of earmarking some of the general local aid funds to one specific purpose seems a remote one. It could work, however, if a portion of vehicle sales taxes were distributed under a new dedicated account, and not as general local aid.

6. Truck Weight-Distance Fees

Evidence indicates that the main cause of pavement deterioration is roadway traffic or use.(21) If a road received no use, time would ultimately cause deterioration due to weather, soil conditions, and construction defects. But deterioration tests conducted in the 1960s suggest that these factors cause deterioration largely by accelerating the damaging effects of traffic.(22) Overwhelming evidence shows that heavier vehicles cause more damage than lighter vehicles, leading some to believe that larger taxes and charges should fall on the motor carrier industry. One form of such an option would be a weight-distance fee, whereby the state would charge fees based on a truck's distance travelled within the state multiplied by a tax rate per mile based on the vehicle's weight. The merit is that the class of users causing much damage to roads would be forced to pay charges more accurately reflecting their cost of usage. Another strong argument for this option over the other state options is that revenue gained from use fees does not fall under the provisions of the revenue cap.

While the advantages of this option stand out, the disadvantages are numerous. They include the fact that a small share of in-state trucking mileage occurs on local roads (as trucks stay on major streets and highways as much as possible); interstate carriers may be subject only to federal weight-distance fees and therefore have an advantage over local carriers; and the trucking lobby has significant lobbying power to stop such an initiative. Finally, the administrative cost of such an option is uncertain, varying from 2 to 11 percent of revenues.(23)

7. Gasoline Tax

The state gasoline tax is currently 10 percent of the state's average wholesale price of motor fuel, adjusted quarterly, with a floor of 11 cents, which is the current tax. This option would raise the tax on gasoline.

The gasoline tax has significant strengths, particularly in the efficiency category. It serves as a worthy proxy to road user fees since gas usage varies with road usage, and as such would perform well in the user-equity sense. Since higher gasoline prices force people to decide among transportation modes, this tax would have a strength in efficiency as well. It would force people to consider the unit costs of more versus less driving, and if high enough, might encourage alternative modes of transportation, thereby reducing the congestion problems in the Boston metro area. A significant advantage to this option is its low administrative costs: only one percent.(24) Also, there appears to be growing public support for higher gasoline taxes.

The disadvantages include making the equity distinction between highway/local road use, the tax's regressive nature, the potential distortionary effect, and the certain battle over who takes the revenue. The equity distinction concerns where most of the gasoline is used; in actuality that is on the highways, making one wonder whether highway travelers should pay for local road maintenance. The tax, like most all user fees, will fall harder on low-income drivers than others. The potential distortionary effect involves the action of neighboring states. While they currently have higher gas taxes than our own (see Appendix 6), if this state were to significantly raise its gasoline tax without corresponding raises in neighboring states, then an incentive (related to the size of the differential) would exist for drivers to cross state borders for their purchases. The certain battle for revenue would follow because of this option's relative political popularity--many groups have their eyes on this option to help solve their problems, and would want a piece of any increased intake.(25)

SUMMARY and the Strongest State Option

To help with the sorting of the options, Table 3 summarizes the options and lists their most compelling strengths and weaknesses. Based on the above discussion and this table, the gasoline tax increase stands out as the strongest state option. The gasoline tax is straightforward, simple, a good proxy for road use, a way to encourage other modes of transportation, and a relatively less painful tax than other state options, particularly since gasoline prices have dropped considerably from the levels of two years ago. Voters are not apt to resist this as much as other state options; the real problem, as mentioned before, is that once chances for a gasoline tax increase look good, many groups will come forward to claim a piece of the increased revenue.

Table 3

SUMMARY OF STATE OPTIONS

OPTION	User Equity	Income Equity	General Efficiency	Politics	NOTES
General Revenue	D	B	D	C	Not dependable for long-term projects
State Bonds	D	B	D	B	Not a good idea for catch-up spending
General Sales Tax	D	D	C	C	Extremely Regressive
Title, Registration, License Fees	C	C	C	C	Overall mediocrity
Auto Sales Tax	B	A	B	C	Overall, not a bad option.
Truck Weight-Distance Fees	A	C	B	D	Large political problems
Gasoline Tax	A	C	A	A	Very strong, except for regressivity

RATING: A Excellent B Good
C Fair D Poor

V. THE STRONGEST STATE AND LOCAL OPTIONS

This section develops further the three most workable options: the gasoline tax just discussed above, and the two local options, the Proposition 2 1/2 override and the auto excise tax increase. It explains the options in more detail, and explores the revenue possibilities of each. At the same time, the report's focus moves from the consideration of individual options to a "systems" approach by examining the theory of combining state and local options into a coherent funding system.

A Shared Burden and Matching Consideration

As noted in Section II of this report, a strong case exists for having both localities and the state contribute to the funding of local road maintenance. The nature of the road system is such that some roads have largely local benefits while some roads have distinctly public benefits. In public finance terms, localities are better able to sense a "willingness to pay," while the state has the ability to efficiently collect a gasoline tax that can then act as an incentive for localities to spend their own money.

Logically, the state will want to continue the "matching grant" idea that drives much of state-local operations. But the model used for matching should not be the one currently used with the Chapter 90 (operating fund) program. The state uses Chapter 90 funds in a way that ensures localities will spend the money on substantial roadwork--construction and reconstruction. Localities cannot use the money for routine maintenance. The matching system currently requires the localities to pay the following proportion for different types of work:

**Construction & Reconstruction (State aid primary system roads)	0%
**Construction & Reconstruction (All other roads)	25%
**Routine Maintenance on All Roads	100%

While the program's intentions are good, one must consider the negative incentives presented by the different matching rates. In a time of tight fiscal conditions, a local highway superintendent knows that providing needed routine maintenance for a road today will cost the town a sum of money; if he lets the road deteriorate to the point where it needs substantial work, the work will be paid for out of Chapter 90 and cost the town little or nothing. In other words, the structure of Chapter 90 runs counter to the principle of spending a little today to save a large amount later. While the town or city saves its own funds by letting roads deteriorate, the cost to society is enormous. (It may be that the Chapter 90 framework contributes to the local road maintenance woes. This is not an indictment directed against Massachusetts and its highway superintendents in particular--Roger Vaughn, an economic development specialist and author of The Wealth of States, recently listed perverse road maintenance incentives as a problem of many states.(26))

This leads to the conclusion that the matching framework, for existing Chapter 90 funds as well as additional funds, should at least be uniform across all types of maintenance work. Some analysts might even go so far as to favor larger matches for routine work, with the idea that the emphasis should be on preventive maintenance; this report, however, builds on the idea of neutral incentives favoring neither routine nor substantial maintenance.

Revenue Forecasts

This section examines the three options in more detail, particularly with respect to how much revenue they might raise. As indicated in an earlier section, the statewide goal is roughly $440 million annually for ten years to bring all roads to excellent condition, and $350 million annually to bring all roads to reasonable condition. In light of the difficulty in raising funds for any increased program, particularly one of this magnitude, this report will show in detail how the $350 million might be raised.

1. Gasoline Tax.

The calculations for gasoline revenue are relatively straightforward. With roughly 2.5 billion gallons purchased in this state on an annual basis (27), every cent increase in the gasoline tax will yield about $25 million in revenue, before making adjustments for the elasticity of demand and the possibility that buyers will go out of state for cheaper gasoline. In general, a slightly higher tax on gasoline in one jurisdiction will not lead to large cross-over purchasing; in particular, Massachusetts has a lower current gasoline tax than any neighboring state (see Appendix 6).

This report recommends an increase of five cents per gallon in the tax floor, from the current 11 cents per gallon to 16 cents per gallon. Such an amount would raise significant revenue without raising Massachusetts' gasoline tax much higher than that of surrounding states (it would still be lower than the Connecticut tax.) With prices currently in the $1 per gallon range, the five percent (five cents) increase with a long-run elasticity of -.76 would mean a 3.8%

decrease in gasoline sales.(28) The resulting revenue would be:

Sales (long run) 2.5 billion x -3.8%	2.405 billion gallons
Price Marginal revenue to local roads	.05 cents per gallon
Available Revenue (An understatement, as short run elasticity is smaller)	$120 million annually

Thus, a five cent per gallon increase in the floor level of the current gasoline tax would raise at least $120 million annually. A later section of this report will address how the state should distribute this money, particularly since any amount raised falls under the purview of the 1986 Revenue Cap.

2. Proposition 2 1/2 Overrides.

This local funding option must be included since it is a current system and will undoubtably be the choice of some communities. It also represents the simplest solution and one that does not fall under the purview of the 1986 Revenue Cap. The relevant question, then, is not whether this option shall come into use but how much an organization like the MAPC should rely on such a mechanism to meet its policy objectives. This report recommends that MAPC not rely on Proposition 2 1/2 overrides as a major revenue option for the following reasons: (a) As already mentioned, larger communities have an especially hard time obtaining the political support for overrides of any sort. (b) In addition, general overrides are especially difficult to accomplish, and capital outlay expenditure exclusions are generally not appropriate for this purpose, which leaves only the debt exclusion option. (c) While some localities will use the debt exclusion option, it cannot be recommended as a panacea for all.

Even if we disregard the problems above, Proposition 2 1/2 will not bring in the sort of revenue needed for a project of this magnitude. Since its inception, Proposition 2 1/2 overrides totalled the following amounts (cumulative through April 1987) (29):

Debt Exclusion Since FY 1983	$45.5 million
General Override Since FY 1983	$19.5 million
TOTAL	$65.0 million

These figures are underestimates since the reported figures do not include, for example, debt voted upon but not issued, as well as debt voted upon for future years. (30) Furthermore, the capital outlay expenditures option first came into use in FY 1988, and will see greater use in the future. But the point remains that $65 million raised over five years does not come close to the amount needed. Clearly, the MAPC should encourage the use of Proposition 2 1/2 overrides to help fix local roads, but should not depend on it as a significant method of raising funds.

3. Auto Excise Tax.

An auto excise tax rate increase, aside from the advantages mentioned earlier in this report, has the potential to raise large amounts of funds. With the current rate of $25 per thousand, the state's localities receive about $240 million annually (31). This report recommends a rate increase to $50 per thousand valuation, which would still leave the rate below its pre-1982 level of $66 per thousand. This rate increase would bring to the towns about $240 million annually for use on local road maintenance, which combined with the $120 million of the state gas tax increase would sum to the total of $360 million annually, just over the target of $350 million.(32) However, as the next section explains, this new rate should vary among cities and towns, allowing cities and towns to set their own rates based on how much road work they needed.

VI. THE IDEAL PACKAGE

What should the overall revenue package look like? As stated earlier, the state should raise revenue from an increased gasoline tax to match increased revenue raised at the local level. The matching system should undergo changes. While the exact matching ratio need not be determined here, the system should at the very least have uniform matching across different types of maintenance work, and thus not lead to the current situation, where localities have a strong incentive to delay routine maintenance. While the foregoing revenue forecasts show a $120 million/$240 million (gas tax revenue to auto excise revenue) ratio, or a 1:2 state/local matching grant, other ratios would work. Additional relevant issues for this report are discussed below: the general framework of local road maintenance aid, the variable auto excise rate settings, the role of Proposition 2 1/2 overrides, and the poor incentives of the current Chapter 90 matching program.

The General Framework for Aid. A separate fund should be established at the state level for the additional gasoline tax revenue.

It would then be earmarked for local road maintenance. The revenue cap implications remain unclear; at best, the earmarking itself may avoid the revenue cap limits, and at worst, a clause may have to be attached to the bill exempting this additional gas revenue from the revenue cap. (This assumes that state revenues will reach their statutory limits in the future, as was the case in FY 87.)

A Variable Excise Rate. The state should set a maximum $50 per $1000 auto excise rate and then allow localities to set their own rates; rates should only be permitted to rise above the current $25/1000 if the locality spends all incremental funds on local road maintenance. In this way, localities already doing a good job on roads need not raise their rates, which may even provide an incentive for sound pavement management. The revenue cap's ramifications on this variable rate remain uncertain; a strict interpretation of Chapter 555 argues that the additional authorized revenue--computed at the new ceiling rate of $50/1000--must be calculated into the state total. But if the rate is not only variable across localities, but variable within one locality over time, the issue is more complex. Possibly, a rate rising to fund only the rehabilitation of local roads for a temporary period of time may not fall under the Chapter 555 restrictions.

The state should match all funds raised at the local level. Not only should the state match incremental auto excise receipts, but it should also match revenue provided for road maintenance by Proposition 2 1/2 overrides, as well as funds provided by towns through regular budget processes. In this sense, the localities would have the choice of raising funds through the measure best suited to their needs.

The money the state currently spends through its Chapter 90 program should go into the new state matching program. A wise policy would involve consolidating both parts of Chapter 90--the operating funds and the bond money--with the new gas tax revenue to match the local revenue. This would simplify the system and eliminate the perverse incentives of the current Chapter 90 system.

VII. RECOMMENDATIONS

This report has looked at the funding of local roads from a broad perspective. It has tried to combine sound economic analysis with a sensitivity to the larger political realities in order to build a general strategy for MAPC's efforts to fund increased maintenance. Much of the work needed in this area will involve detailed negotiations and compromises, as well as sensitivity to issues not foreseen at the time of this report. But some of this report's basic principles will carry the overall strategy quite far: ensuring that revenue sources have a strong relation to costs of road usage or benefits received; the need for combined state and local funding; the need for sound, rational maintenance incentives for local officials; and the idea of flexible funding sources to allow towns to raise only as much money as is directly necessary. These ideas will form the backbone of the MAPC's efforts, even if negotiations distort many of this report's provisions.

This report recommends that the MAPC pursue the following courses of action:

An increase in the state gasoline tax. The MAPC should propose a five-cent per gallon increase of the base level of the current law, with the incremental revenue allocated to a new local road maintenance fund.

An increase in the auto excise tax. The MAPC should propose that localities be permitted to increase the auto excise tax from the present $25 per $1000 valuation to as much as $50 per $1000 valuation, with the proviso that revenue raised at rates higher than $25 per $1000 go to increased spending on local road maintenance. This tax increase would raise the majority of local revenue for this purpose, though Proposition 2 1/2 overrides for the express purpose of increased local road maintenance would also raise local funds.

Establish a new fund with new matching incentives. The MAPC should begin working on detailed plans for a new, dedicated fund for local road maintenance. Such a fund is necessary to avoid the limits of the 1986 Revenue Cap, as well as to avoid the problems of the current Chapter 90 program, which favors substantial maintenance over routine maintenance. Ideally, the funds currently under Chapter 90 could be absorbed into the new fund, but the political strength of the Massachusetts Department of Public Works and other entities will preclude any near-term action. For now, the MAPC should ensure that the new money raised by the increased state gasoline tax goes into the new account, which should have neutral incentives for substantial versus routine maintenance.

Finally, the MAPC should take the above recommendations and lobby not only at the state level, but also at the local level, since much of the proposed program's success or failure will hinge on how well localities understand and support its provisions. The MAPC should coordinate its advocacy of increased funding with the other regional planning agencies, with the influential town managers and highway superintendents, and other relevant local contacts. The key to this plan should be the mix of minds and dollars from both the state and local levels to solve a problem that one level cannot solve alone.

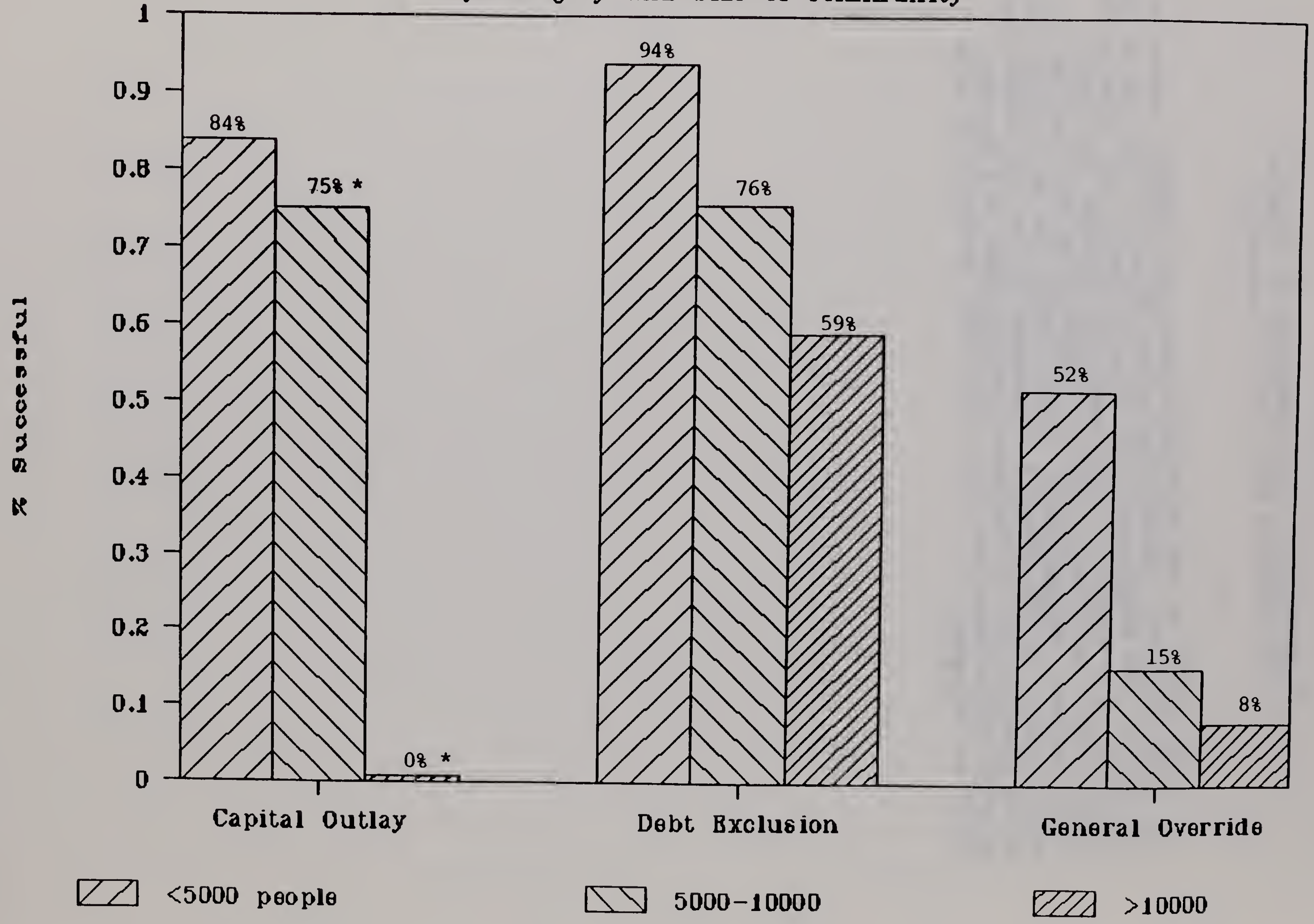
APPENDIX 1

Proposition 2 1/2 Overrides By Category of Override and Size of Community

The graph on the next page shows how general overrides are difficult for communities of any size; it also shows that the larger the community, the more difficult any type of override becomes. The capital outlay override figures for medium (5000-10000) and large (>10000) communities had samples of four and two, respectively, which limits how much faith one should place in the numbers. However, while one should not place great faith in the exact percentages, the general pattern makes sense and will not likely change with more override attempts.

PROPOSITION 2 1/2 OVERRIDES in FY 87

By Category and Size of Community



*indicates a small sample

APPENDIX 2

Further Explanation of Table 2

Estimated current spending by localities on roads: this is as reported by localities on their Municipal Schedule A. It is the amount spent by towns on all functions related to roads--not just maintenance.

Reimbursements by the State:

Chapter 90 matching:	restrictions on these funds force towns to spend them on substantial road maintenance; for more information, see Appendix 5
Chapter 90 bonds:	the state issues bonds and gives the proceeds to localities for substantial road maintenance; no matching requirement
Chapter 81:	partial reimbursement to localities for construction, maintaining, and policing their roads; no matching requirement; for more information, see Appendix 5
Other:	comprised of Special Revenue Funds, Capital Projects Fund and Special Assessment Funds

Total spent by localities and not reimbursed by the state: this is the total local spending on roads less state reimbursements. NOTE: The Highway Reconstruction and Maintenance account was not included since the funds go to transit purposes (MBTA fringe communities) or to general revenue (non-MBTA communities). More information, Appendix 5.

Amount collected by localities from the auto excise tax: this is from the FY 87 Tax Recapitulation Sheet.

SOURCE: MA Department of Revenue, Division of Local Services

APPENDIX 3

Transportation Utility Service Fee (TUF) Systems

This appendix shows examples of working* TUF systems. The following two pages shows the Fort Collins, Colorado system of assessing charges. It is very simple. Following the Fort Collins material is a summary of the Pocatello, Idaho system, which uses the Institute of Transportation Engineers methodology, a more complex system, for assessing fees. (Sources: Fort Collins highway department and the Pocatello, Idaho city manager's office.)

*See Appendix 4 for an article on litigation.

~~within the city and the owners and occupants thereof a transportation utility fee. This fee~~ is deemed reasonable ~~and~~ is ~~necessary to pay for the operation, administration~~ and main~~tenance of such existing local streets as may be established within~~ the city.

§ 108A-6. City to maintain local streets; exception.

The city shall maintain all accepted local streets within city-owned land, city rights-of-way and city easements and may maintain other accepted local streets within or adjacent to the city. Such local streets specifically exclude private streets and streets not yet accepted by the city for maintenance.

§ 108A-7. Determination of utility fee.

The fee established herein shall be based upon the following factors: the amount of frontage in linear feet that each lot or parcel has on the right-of-way of an accepted street; the base rate maintenance cost for each foot of frontage; and the developed use of the property (which includes the amount of vehicular traffic generated by the property). The Director shall determine the category that shall apply to each lot or parcel within the guidelines herein set forth and shall establish the fee in accordance with the category of use and the following factors:

A. Frontage. Except as otherwise herein defined, the frontage of each lot or parcel shall be measured along the right-of-way of the street on which the property is located. In the case of a lot or parcel having frontage on more than one (1) street, the frontage shall be measured along all streets on which the lot or parcel has frontage.

B. Base rate. The base rate maintenance cost shall be $0.0143 per foot of frontage per month for all developed properties within the city.

C. Categories of developed use. Each lot or parcel shall be placed by the Director in a specific category of developed use, which category shall be based upon the actual land use of the subject lot or parcel. Such categories shall include:

(1) Single-family residential.

(2) Multifamily residential.

(3) Nonresidential.

D. Traffic generation factor. The traffic generation factor for each category of developed use shall be as follow:

Category of Use	Generation Factor
Single-family residential	1.00
Multifamily residential	0.65
Nonresidential	4.00

E. Fee formula. The monthly fee for each lot or parcel shall be calculated according to the following formula:

Monthly fee = (base rate) × (frontage) × (traffic generation factor)

F. Minimum and maximum fee. Notwithstanding the foregoing, the minimum charge for any lot or parcel shall be seventy-five cents ($0.75) per lot or parcel. In the case of any lot or parcel whose category of developed use is determined to be multifamily residential, the monthly fee shall be not less than the equivalent of seventy-five cents ($0.75) per month per dwelling unit, nor more than one dollar and fifty cents ($1.50) per month per dwelling unit. In the case of a lot or parcel of land having frontage on more than one (1) street and having a category of developed use determined as single-family residential, the total street frontage shall be divided in half for the purposes of determining the fee.

§ ~~108A-8. Billing and collection of fee.~~

Th~~e fee shall be billed and collected with the monthly utility bill~~ f~~or those lots or parcels utilizing city utilities and billed~~ and c~~ollected separately for those lots or parcels and owners~~ thereof

METHOD USED BY POCATELLO, IDAHO

AD HOC COMMITTEE OF PUBLIC WORKS PROFESSIONALS

STREET AND ARTERIAL FUNDING PROPOSAL

Purpose

The purpose of the committee's proposal would be to establish, through legislation at the state level, the local option for municipalities in the State of Washington to provide local funding for streets and arterial systems within each jurisdiction on a broader base than is currently possible.

Proposal

The proposal is to amend state law to permit cities and towns to classify their street and arterial systems as a separate enterprise and utility, similar to the status of water, sewage and drainage systems as they currently exist. Specifically, our proposal is to pass the attached legislation which would allow cities and towns to charge fees against owners and occupants of property for the use of streets placed in the separate enterprise and utility system.

Need

It is generally agreed among municipal officials and public works professionals throughout the State of Washington that our roadway systems are suffering from substantial underfunding. Few new roads are constructed, even where known needs exist, and the operation and maintenance of existing roads has placed many of them in a badly deteriorating state. Evidence of this is to be seen in the unfunded UAB program still before the State Department of Transportation and in annual reports of the cities and counties, as well as the state DOT. A good summary of the unfunded needs facing the cities of Washington is to be found in the report on street funding prepared by the Association of Washington Cities for the State Legislative Transportation Committee, dated July 18, 1980, a copy of which is attached.

There is no question but that gas tax revenues have not been sufficient to keep up with the underlying commitment to operation and maintenance now facing the cities, counties, and the state.

This proposal is designed to provide more reliable funding at the local level for the municipal problem of streets and arterials. A similar approach could be taken at other levels, such as counties and the state; however, other means, we believe, are more appropriate there.

Steps Required

1. Obtain legislative permission at the state level for local option funding decisions.
2. Take action at the local level to establish street and arterial systems as a utility function of the municipality.
3. Pass the necessary ordinances to define the street and arterial system and to establish the basis for future bonding and rate structures.
4. Establish actual rate structures and billing procedures, using the municipalities' existing systems.
5. Revise current budgets, or budgets to be developed in the subsequent years, to reflect the change in funding sources for streets and arterials to provide the higher level of operation, maintenance, and capital investment that would be possible once adequate funding is obtained.

Determination of Specific Costs Within the Municipality

The accounting system established by the state BARs system allows us to readily determine the money spent for street and arterial operation, maintenance, and capital investment. Usually included in the BAR accounts for streets and arterials are street construction, street maintenance, street sweeping, street lighting, drainage, sidewalk and catch basin; traffic signals and signalization, signing, and certain other miscellaneous costs related to the development and continued functioning of the street and arterial system.

To these normally budgeted accounts, one would add the capital program, whether as debt service if revenue bonds were used to fund streets, which would be possible if it were a utility; or as certain other budgeted capital and LID programs. Once all costs have been established, together with what other sources of income in terms of contributions from other departments or services that were rendered and charged for on a separate basis, the total income needs would be determined. From the total costs one would subtract the income from the gas tax which would be assumed to continue, any income for specific capital improvements, such as UAB, block grants, EDA or other sources, charges against new development (i.e., system development charges), and finally, one would determine the net cost to be determine the net cost to be funded locally through a system of charges and taxes.

With the total local cost known, the total number of funding units in the municipality would be divided into this amount and this would become the annual or monthly charge for street and arterial systems. There are many ways of determining the exact rate structure, some of which will be discussed in the next section.

Methods of Service Charge Determination

The basic concept of any utility is to charge users of that utility on the basis of their use. This is done in water, sewerage, and drainage on a regular basis and we believe it can be done for transportation facilities if one adopts certain basic criteria in the beginning.

There are a number of alternatives available for establishing service charge rates within a municipality. The basis for rates could be based on:

Residential

1. Common charge for single-family units
2. Equivalent charge for multifamily units
3. Number of vehicles owned
4. Number of garage or parking stalls
5. Lot area
6. Institute for Transportation Engineers (ITE) standards

AN EXAMPLE

Expenditures for the Annual Street Budget= $ 2,000,000

Income

Gas tax related revenues, including state shared revenues and ½¢ gas tax funds	$ 500,000
Miscellaneous fees and charges	100,000
Local funding, currently primarily from general fund property taxes	1,400,000
Total	$2,000,000

Number of Chargable Service Units

	Gross	SFU Equivalents
1.	15,000 single-family dwelling units @ 1 SFU/unit	15,000
2.	5,000 apartments and condos @ 0.6 SFU/unit	3,000
3.	400,000 GSF restaurants @ 20 SFU/1,000 GSF	8,000
4.	3,000,000 GSF commercial mixed, @ 5 SFU/1,000 GSF	15,000
5.	5,000,000 GSF industrial, mixed @ 1.0 SFU/1,000 GSF	5,000
6.	1,000,000 GSF institution, mixed @ 2.0 SFU/1,000 GSF	2.000
	TOTAL SFU BILLABLE	48,000

SFU: Single-family unit, where 1 unit is equal to:

an ITE trip generation rate of 10 average weekday trip ends per unit. A flat monthly charge is assessed for each SFU. Different amounts of SFUs are used for different land uses.

Rates and Charges - Assuming all local costs recovered through service charges

Rate per SFU equivalent = $\frac{\$1,400,000}{48,000\ SFU}$ = $29.17/SFU/Yr or 2.40/SFU/Month

Restaurants, 30,000 GSF x $\frac{20\ SFU}{1000\ GSF}$ x $2.40 = $144.00/Mo.

Commercial 100,000 GSF x $\frac{5\ SFU}{1000\ GSF}$ x $2.40 = $1,200.00/Mo.

Industrial 100,000 GSF x $\frac{1\ SFU}{1000\ GSF}$ x $2.40 = $240.00/Mo.

Final charges can be adjusted by adjusting the AWVTE equivalents that define each land use category.

This example assumed that all local costs would be paid through user service charges. This is not likely to be the actual case, since there is a strong rationale for continuing to provide some tax support to the street and arterial program and, like other utilities, the street utility should collect some form of system development charges (SDC) against new development. For a city the size of our example, in a normal economic year we could expect at least a five percent growth in SFU equivalents, or 2,400 SFU. Assuming an SDC charge of even $200 for an average dwelling, this would produce an income of:

$\frac{2,400}{10}$ x 200 = $48,000/year

Additionally, if we assume that at least 25 percent of the local funding would continue to be tax supported, the net funding from service charges would be reduced to:

Local funding required	$1,400,000
less tax support of 25%	-350,000
less SDC fees	- 48,000
Net local funding from service charges	$1,002,000

$$\text{Rate per SFU equivalent} = \frac{\$1.002.000}{48{,}000+2{,}400} = \$19.38/\text{SFU/Yr. or}$$

$$= \$1.66/\text{SFU/Month}$$

Obviously, many variations in final rate structure are possible and only a careful economic analysis can develop the best program for each jurisdiction.

Public Safeguards

State law requires cities to keep accurate and uniform records of all income and expenditures related to streets and arterials. Cities must also file annually updated six-year capital construction work plans with the state. Almost all cities also prepare annual needs surveys and work plans related to the repair and maintenance of streets and arterials. As a result of these records it is unlikely that a city would charge expenses other than street and arterial costs to a street utility. However, normal city administrative and overhead charges are and should be allocated to all utilities and city functions.

Since decisions related to such a utility would be made by the local elected officials, there is an assurance that public input and information would be a part of that decision-making process. The public would be asked to contribute more money to the city budget as a result of the street utility approach; however, the need for additional investment in streets and arterials is well documented and should receive a high level of public support.

APPENDIX 4

TUF Systems in Court

The next page outlines the situation of the Fort Collins, Colorado TUF. It was struck down in court because it was found to be a property tax, and the Colorado constitution does not allow such a tax. The city has appealed the verdict. The Pocatello TUF is also in court; the groups filing suit claimed the TUF system was an invalid approximation for assessing fees.

The resolution of these cases will go a long way toward determining whether or not (a) the TUF is a disguise for a property tax, and (b) the ITE assessment system is a worthy approximation of road benefits received by entities.

Court bars city's transportation fee

By STEVE PORTER
The Coloradoan

8-18-87

Fort Collins may not continue to assess its transportation utility fee while a suit filed against the city is appealed, Judge Arnaud Newton has ruled.

"The court considers this to be the most equitable way of handling the matter pending the appeal," Newton said in his ruling.

City attorneys had asked the court to allow the city to keep collecting the fee and to put the money in escrow until a final decision is made.

The transportation utility fee, adopted by City Council on Jan. 17, 1984, is an important source of street maintenance funding for the city. The fee generates between $400,000-$500,000 a year. About $1.5 million has been collected since the fee went into effect in May 1984.

But that funding source came to a halt June 4 when Newton ruled in favor of the parties in a class action suit against the city. Plaintiffs are Arvid and Beverly Bloom and others. In the June 4 ruling, Newton declared that the transportation utility fee "constituted a propert tax and as such was invalid."

If the city is unsuccessful in appealin the decision against the fee, all of th money collected to date — with Interes — must be repaid to city utility customers.

In addition to denying the city's motion to keep collecting the fee, Newton granted motions by city attorneys for a stay on paying back already collected fees and for developing a plan of restitution to city residents. The judge had ordered that the city must develop such a plan within 45 days of his decision, which was issued June 4.

Newton also denied a motion by the plaintiff to approve an interim award of attorney fees, which he called "premature."

SOURCE: The Fort Collins Coloradoan, 18 August 1987

APPENDIX 5

Information on Existing State Local Road Maintenance Programs

The next five pages explain the existing state programs helping localities with their local roads. These are the major programs; many other minor programs exist, such as economic development funds that may go to local road improvements, and a fund to help small towns in the western part of the state, but their overall impact is small.

DETAILS

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
State Aid Programs

Name of Program: State Aid Highway (sometimes called "Chapter 90")

Authorization: Massachusetts General Laws C. 90, S. 34

Funding: Appropriation Item in Annual Budget (e.g., Ch. 234, 1984), also Supplementary Transportation Bond Issues (e.g., Ch. 637, 1983)

Contact Person: District State Aid Engineer (see Appendix O)

Amount of Funds: The Department notifies the duly authorized local officials after each year's appropriation of the amount allocated to their communities. This is determined by the following formula:

$$50\% \quad \frac{\text{(\# of miles of Public Ways under City/Town control)}}{\text{(total \# of miles of Public Ways in Commonwealth under City/Town control)}}$$

$$25\% \quad \frac{\text{(City/Town's Population)}}{\text{(Commonwealth of Massachusetts Population)}}$$

$$25\% \quad \frac{\text{(\# of Persons Employed in City/Town)}}{\text{(\# of Persons Employed in Commonwealth)}}$$

Purpose of Program: Construction, reconstruction, and improvement including surface treatments on all approved public ways which qualify.

Eligible Activities: All operations on the travelled way of new locations or where considerable reconstruction is to be undertaken, including resurfacing (the minimum shall be 3/4" course with a continuous length of 500'); and other work incidental to the above such as preliminary engineering, including State Aid/Consultant Design Agreements, right-of-way acquisition, shoulders, side road approaches, landscaping and tree planting, roadside drainage, structures (including bridges), sidewalks, traffic control and service facilities, street lighting (excluding operating costs), and for such other purposes as the Department may specifically authorize.

Local Share Requirement:

Not Required - For work on State Aid Primary System roads

25% - For local roads not on the State Aid Primary System

Local Responsibility:

I. Effective February, 1984, the design and construction decisions for Chapter 90 Projects are the responsibility of the Municipality.

II. Funds from the 1983 Transportation Bond Issue (Ch. 637) were distributed as a direct grant to each Municipality. The Municipality is required to file with the District Office an Initial Advisory Report for each project before expending the funds, and a Final Advisory Report when each ("Chapter 90 Bond Issue Project") is completed

Procedure for Funding Chapter 90 Reimbursement Projects:

1. MDPW notifies communities of their allocation and information on eligible activities under this program.

2. Community's duly authorized official sends letter to District Highway Engineer listing intended highway project requests for the coming year. Priorities should be limited to projects that will be done that year.

3. A Memorandum of Agreement (MA) of funds will be sent to the town/city for signatures. Both signed copies will be returned to the District. The District will check the MA's and forward them to Boston office for processing.

4. For each project, "Chapter 90" Project Request Form (forms available at District Office) must be submitted along with an attached preliminary estimate showing anticipated quantities and cost of project. If the submittals are complete and correct this will expedite the District State Aid Engineer's review and approval.

5. Approval by the District Highway Engineer is necessary prior to the start of the project. No expenditure for reimbursement from these funds shall be made before receipt of approved Project Request Form and approval to proceed from the District Highway Engineer.

6. These State Aid funds are reimbursement funds so initial funding needs to be voted at a Town Meeting or by City Council. The town/city will be notified by the Department of the amount and Chapter of funding source. The District State Aid Office will advise as to the monies depending on the type of project to be constructed (Primary or Local).

7. An approved layout, easement, and takings necessary for the project must be obtained by the Town/City before the project begins.

8. Although the municipality's adopted no bid limit by-law may be $4000.00 or less, to avoid the possibility of inadvertently exceeding the legal limit, any item anticipated to exceed the expenditure of that amount should be advertised for bid.

9. The Department has established a list of the maximum rates for Hired Equipment and Town Owned Equipment that have been furnished to the municipality. If Hired Equipment cannot be obtained for these Rates, you may advertise for bids on the equipment needed. The municipality is reminded of Ch. 149, S. 27: A schedule of prevailing wages for public works projects involving the lease, rental, or other arrangement for the use of automotive or other vehicles and equipment must be included in the bid specifications.

10. Orders for items supplied by the Correction Industries must be made out by the municipality and sent to the Massachusetts Department of Corrections. Division of Prison Industries, Post Office Box 135, Norfolk, MA 02056 prior to the start of construction. If they cannot supply the item, a copy of the prison release must be attached to the Request for Reimbursement.

11. Advertised projects valued at $50,000 or more must have prequalified Contractors; state this requirement in Notice to Contractors.

12. A "Chapter 90" Request for Reimbursement along with Payroll and Equipment Form (HED 600) and/or Materials Form (HED 454) can be submitted on a timely basis after start of construction. The Request for Reimbursement should only be submitted for substantial amounts. These forms will be available at the District Office. Please note, these forms must have check numbers or signatures and signatures of highway official, selectmen/mayor and town accountant or city solicitor. There are certification statements on the Request for Reimbursement Form attesting accuracy and that requirements have been met as to procedures, bids, rates, etc. An invoice prepared by the District will be forwarded to Boston for processing and payment or reimbursement.

    All bills will be retained on file by the municipality in accordance with Executive Order #195 (April 27, 1981).

13. The municipality should daily assign a sworn weigher to any plant supplying materials where weigh slips will be used to determine quantity of bituminous concrete for roadway paving.

14. The Town/City should daily assign a plant inspector to any plant supplying bituminous concrete or cement to insure a quality product. Certificates of compliance shall be required on any material not covered by plant inspection. All materials must conform to the Department's Standard Specifications.

15. When the project has been completed, the town/city shall prepare and submit a Chapter 90 Project Final Report Form with Final Request for Reimbursement.

16. The District Highway Engineer will report that the work has been completed based on documentation received from the city/town and the Request for Reimbursement is processed.

17. The use of outside engineering services for design and construction will be acceptable for payment from State Aid Funds; however, the engineering services shall be submitted by a registered professional engineer with a reputable background of satisfactory performance, provided prior approval for engineering services has been obtained through the Department.

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
State Aid Programs

Name of Program: Highway Fund G.L. Ch. 81 S. 31; 1980, Ch. 577, S. 3
(A Cherry Sheet Item)

Authorization: Massachusetts General Laws, Chapter 81, S. 31

Funding: Appropriation Item in Annual Budget ($21,181,200. appropriated for FY 83)

Contact Person: District State Aid Engineer (see Appendix D)

Amount of Funds: The amount each community receives is determined from information collected by the MDPW for road mileage, motor vehicle registrations, the equalized property valuations, and the certifying report completed and returned to the MDPW each year on its HED-077 Form (see attached).

Purpose of Program: Partial reimbursement as an offset to the municipalities for costs (not reimbursed by Chapter 90) in constructing, maintaining, and policing their public ways.*

Eligible Activities: See attached HED-077 Form. Note that "policing" is for all operations having to do with the direction or control of traffic by enforcement officials on city/town travelled ways. Allocating up to 25 percent of overall police budget to traffic "policing" as defined here is acceptable.

Local Share Requirement: None; however, it is recommended that the amount of this Cherry Sheet Item be made available for the repair and maintenance of the municipality's highway investment.

Procedure For Obtaining Allocation:

1. Community is advised of its allocation on its "cherry sheet."

2. City Council/Town Meeting votes to approve its annual highway budget.

3. Chief elected official submits HED-077 letter to MDPW District Highway Engineer certifying the amount expected to be incurred during the upcoming fiscal year, for the constructing, maintaining and policing of its public ways in accordance with Ch. 81, S. 31 of the General Laws.

4. On or about December 1st, the Commissioner of Public Works certifies to the Commissioner of Revenue the estimated amounts required to be distributed to each city or town under this legislation.

5. The State Treasurer distributes to the cities and towns approximately fifty percent of the amount prior to December 31st, and the balance on or before June 30th of the following year.

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* ~~The original Act ([illegible], Ch. [illegible]) increased the excise upon gasoline and special fuels for the purpose of providing additional revenue to cities and towns for highway purposes.~~

HIGHWAY RECONSTRUCTION AND MAINTENANCE

DETAILS:

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
State Aid Programs

Name of Program: Highway Reconstruction and Maintenance
Highway & Transit Fringe MBTA Communities
(A Cherry Sheet Item)

Authorization: Acts of 1974, Chapter 825

Funding: District State Aid Engineer (~~see Appendi~~x D)

Amount of Funds: On the FY '83 cherry sheet, there are two categories of funding: 1) the 272 communities outside of the MBTA district and 2) the 80 communities on the fringe of the MBTA core area. MAPC communities in the first category are: Acton, Bellingham, Bolton, Boxborough, Carlisle, Essex, Foxborough, Franklin, Gloucester, Holliston, Hudson, Ipswich, Littleton, Marlborough, Medway, Milford, Rockport, Southborough, Stoughton, Stow, Wrentham.

MAPC communities in the latter category are: Ashland, Bedford, Beverly, Braintree, Burlington, Canton, Cohasset, Concord, Danvers, Dover, Duxbury, Framingham, Hamilton, Hanover, Hingham, Holbrook, Hull, Lincoln, Lynnfield, Manchester, Marshfield, Maynard, Medfield, Middleton, Millis, Natick, Needham, Norfolk, North Reading, Norwell, Norwood, Peabody, Pembroke, Randolph, Reading, Rockland, Scituate, Sharon, Sherborn, Stoneham, Sudbury, Topsfield, Walpole, Wayland, Wellesley, Wenham, Weston, Westwood, Weymouth, Wilmington.

Purpose of Program/Eligible Activities:

Fringe MBTA Communities: Eligible activities are limited to those pertaining to mass transportation services.

Non-MBTA Communities: Although funds may be used for any municipal service, preference should be given to highway and transit development activities.

Local Share Requirements: None

Procedure For Obtaining Allocation:

1. Community is advised of its allocation on its "cherry sheet".
2. Around the second Tuesday of March, the State Treasurer distributes the amount allocated to the 272 cities and towns under this program; the MDPW distributes the amounts for the 80 cities/towns during the second quarter of the state fiscal year (October-December).

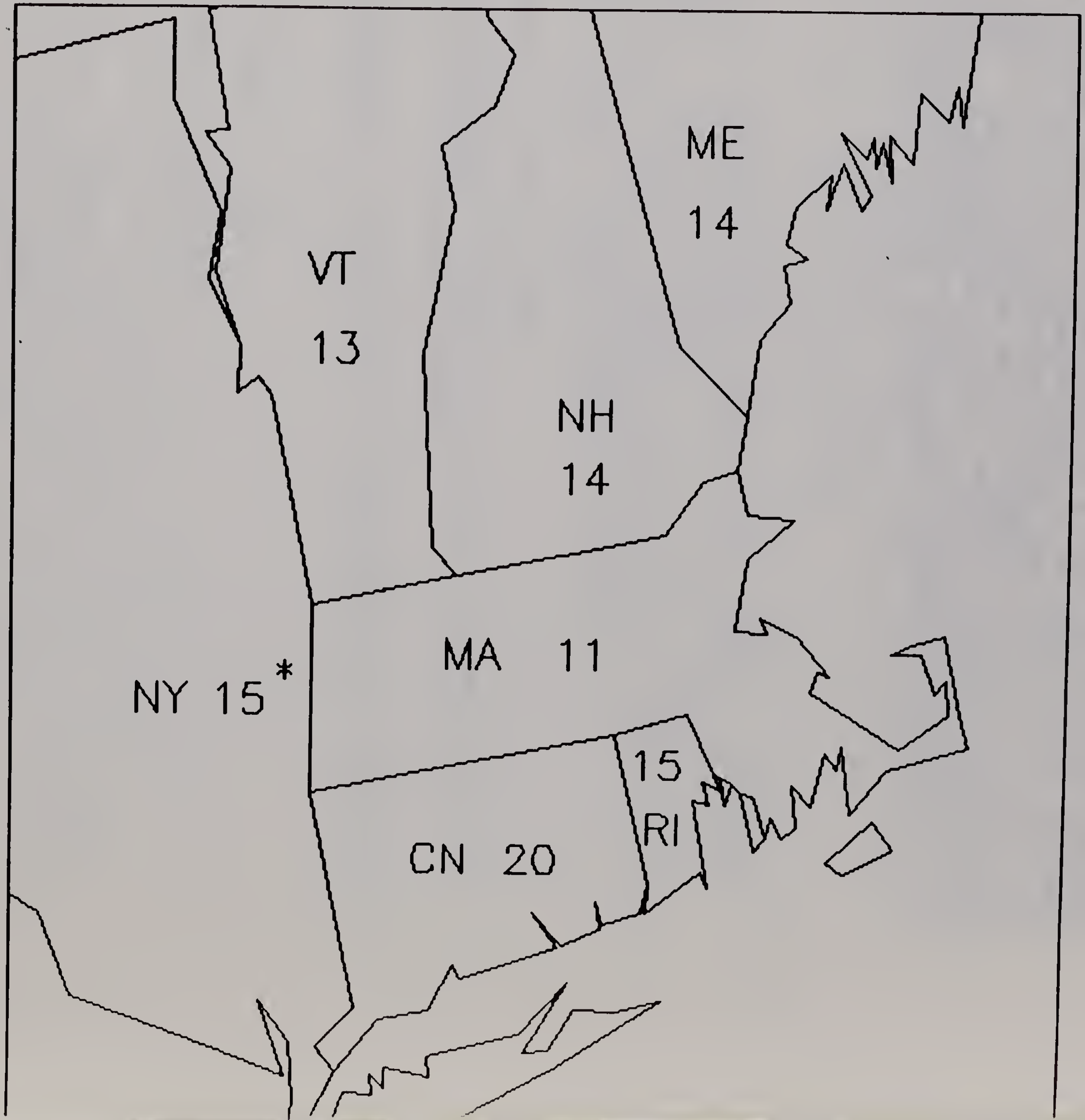
APPENDIX 6

Information on Surrounding States' Gasoline Taxes

The map on the following page shows current gasoline taxes in states surrounding Massachusetts. The Rhode Island figure does not include a 2% oil company gross earnings tax. The New York figure is an approximation for the Albany area based on the 8 cent per gallon state tax, the 6% county sales tax, and a 2.75% oil company gross earnings tax. (New York information from Mr. William Frank, NY Department of Taxation and Finance, Audits Division. All other information from The Road Information Program, Washington, D.C.)

CURRENT GASOLINE TAX, BY STATE

Cents Per Gallon



*represents an approximation; see previous page for details

NOTES

(1) ICMA, The Municipal Yearbook, 1986.

(2) Ibid.

(3) Massachusetts Taxpayers' Foundation, Concrete Realities:The Capital Needs of Massachusetts Cities and Towns and the State's Assistance Strategy, 1982, p.7.

(4) Ibid.

(5) Metropolitan Area Planning Council, Funding the Rehabilitation and Reconstruction of Locally-Maintained Roads in the MAPC Region. October 1987, p. 10.

(6) The MAPC study found that approximately 44% of locally-maintained roads in the greater-Boston area are in fair or poor condition, i.e., in need of immediate care.

(7) MAPC study, p.25.

(8) The Road Information Program, An Analysis of the Economic Benefits of A Highway Repair Program in Massachusetts. August 1982, p.4. The exact figure was $497.5 million a year for ten years, which would improve all roads and bridges. The MAPC figure includes neither state-maintained highways nor bridges, and is $60 million less than TRIP's figure, even before adjusting for inflation between 1982, and the date of the MAPC report, 1986.

(9) Massachusetts Taxpayers' Foundation 1982 report, p. 11.

(10) Interview with Mr. Don Page of the MDPW Bureau of Transportation Planning and Development, 23 February 1988.

(11) Conversation with Mr. Kevin Malley of the Fiscal Affairs Division, Executive Office of Administration and Finance, 17 February 1988.

(12) Robert Tannenwald, "Massachusetts' New Tax Cap: Needed Discipline or Excessive Restraint?" New England Review, Federal Reserve Bank of Boston, p.10.

(13) The idea of localities surrendering autonomy and fiscal responsibility to the Commonwealth is a key theme of the Massachusetts Senate Ways and Means document Agenda 90: A Voice for Local Government, prepared for the FY88 budget process; Proposition 2 1/2's constraints have played a large part in this trend.

(14) The percentage of successful override figures in this section are from: Massachusetts Department of Revenue, Division of Local Services, Proposition 2 1/2 Overrides. Association of Town Finance Committees Ninth Annual Conference, December 8, 1987.

(15) From the Massachusetts Department of Revenue, Division of Local Services, pamphlet titled Proposition 2 1/2 Overrides: A Report on Massachusetts Municipalities Use to Date on the Override Provisions of Proposition 2 1/2, April 87. An example is on page 6: "All successful (general) overrides have been voted by towns; no cities have been successful (since 1982) in voting overrides."

(16) Conversation with Mr. Chip Faulkner of Citizens for Limited Taxation, 12 February 1988.

(17) If bonds fund a capital budget project with benefits for future users, then a better argument exists for bond use; however, in this case much of the work is "catch up" for previous neglect, and bonds, which pass off costs to future users, are less appropriate.

(18) Dr. Anthony Kane and Mr. Thomas Cooper, A Preliminary Evaluation of Potential Sources of Revenue for Highway Finance. Federal Highway Administration, draft, p. 24.

(19) Such a high administrative cost--13%--may be warranted due to the regulatory nature of the system. In other words, the administrative costs are not due solely to collection efforts, as is the case of a gas tax. Here the purpose of the program is regulatory as well as revenue generation.

(20) Conversation with Mr. Kevin Malley of the Fiscal Affairs Division, Executive Office of Administration and Finance, 17 February 1988.

(21) Jose Gomez-Ibanez and Mary O'Keefe, The Benefits from Improved Investment Rules: A Case Study of the Interstate Highway System, report prepared for the U.S. Department of Transportation, Office of University Research, July 1985, pp. 36-37.

(22) Ibid.

(23) Kane and Coooper, p. 24.

(24) Ibid, p. 23.

(25) As in the case of license and registration fees, the argument could be made that as the Highway Fund currently runs a deficit, then so could any revenue increases be immediately gobbled up into it; but this does not recognize the reality of the political debate of gas tax hikes, where many groups seem to have a claim on the potential revenues, unlike the case with license and registration fees.

(26) From a speech at the Kennedy School of Government, Harvard University, Cambridge, Massachusetts, 4 March 1988.

(27) From the Federal Highway Administration.

(28) The short-run elasticity is -.21, and the numbers are Federal Energy Administration estimates from Financing Transit: Alternatives for Local Government. Prepared by the Institute of Public Administration, Washington, D.C., for the USDOT Urban Mass Transportation Administration, Office of the Secretary, July 1979, p. 163.

(29) From the DOR source cited in (15) pp. 5 and 8.

(30) Ibid.

(31) Current data from DOR's Division of Local Services; the number represents funds collected for the specified fiscal year as well as funds collected that were owed from previous fiscal years.

(32) The revenue forecast for an auto excise rate of 50/1000 is an overstatement, since part of the current annual intake is unclaimed rebates of car owners who have obtained a new or used auto after paying the entire excise bill on the previous auto. Once they trade in or sell their previous car, they may claim a rebate; the rate of those who claim a rebate will rise with a higher excise tax rate, and thus reduce the revenue.